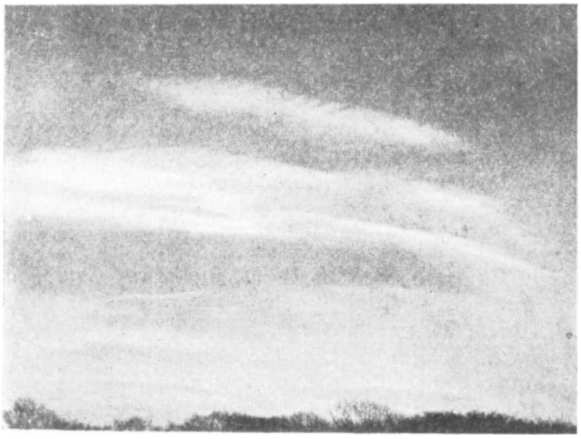
LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Clouds and Shadows.

IN NATURE of April 18 Mr. Charles Tilden Smith described a cloud-like appearance which he considered was no cloud, as it remained quite stationary while stratus and small lower clouds were driven quickly across the sky. I think I can throw some light on the subject, as I observed a similar appearance both on April 5 and on April 8, the date of Mr. Smith's observation.

On April 5 I was observing pilot balloons when my attention was directed to a cloud which formed in the east; it was a cloud with very soft edges, which were constantly changing their shape and were frequently ripple-marked. I enclose a photograph of the cloud taken about 6 p.m. What chiefly attracted my attention was the fact that the cloud remained stationary, though it was obvious from the motion of the pilot balloons that there was a very strong wind in the upper air. The pilot balloon ascents at 5.27 p.m. and at 6.24 p.m. showed that at one kilometre above the surface the velocity was 20 metres per second or more, which is fairly high for such a low level; the velocity fell off a little at greater heights, but it was 15 metres per second or so at three kilometres.



As a north-west wind, which was the direction on this day, never seems to decrease very materially below the level of the stratosphere, it is obvious that the cloud in question was remaining stationary, though it was floating in a strong wind; presumably the particles of which it was composed were condensing on the windward side and evaporating on the leeward side of the cloud, as in cloud streamers seen round the peaks of mountains. That this was really the case I could not determine at the time, as I was taking observations of balloons, but on April 8 I noticed very similar clouds shortly before sunset, and by watching them carefully it was quite clear that in this case the above supposition was correct. There was a great development of these soft-edged clouds just before sunset; they were arranged more or less in parallel bands, with a vanishing point in the south-west; the particles of which they were composed were coming from the north-west. At one time I noticed that the edges of one cloud broke up into ripple clouds which moved rapidly from the north-west until they reached another cloud into which they merged.

If Dr. W. N. Shaw's supposition is correct that changes of pressure in the lower layers of the atmosphere are caused very largely by changes which occur in the level just below the stratosphere, it follows that a diminution of pressure at this level will cause a decrease of pressure through the whole of the underlying layers, and, as Dr. Shaw has pointed out, condensation and formation of cloud may take place wherever there happens to be a damp layer, and we get, what is so often seen, the simultaneous formation of sheets of cloud at widely different levels.

On April 5 there was a great development of cloud at different layers at sunset. If at any particular layer condensation is almost taking place, any uplift of air will hasten it, and any wave motion that may exist will become visible by condensation in the wave crests. On April 5 the strong wind passing over the irregularities of the surface, such as the South Downs in this neighbourhood, might have caused local uplifts of air which might have extended to considerable heights; thus at some particular layer condensation might take place, the cloud particles forming where the air was rising and evaporating further to leeward, where the air was descending. Soft-edged clouds, formed in a somewhat similar way, may sometimes be seen covering the tops of the Downs and closely following their contours, giving the hills a strange appearance of increased height, as recorded by Richard Jefferies in "Wild Life in a Southern County."

It is difficult to estimate the heights of the clouds seen on April 5 and 8, but I think, though I am not quite sure, that I saw a pilot balloon projected on one of them when it was at a height of about three kilometres; if this were so, the clouds must have been at a greater height.

CHARLES J. P. CAVE.

Ditcham Park, Petersfield, May 5.

Mammalian Remains at the Base of the Chalky Boulder Clay Formation in Suffolk.

MR. E. P. RIDLEY, Mr. Frank Woolnough, curator of Ipswich Museum, Mr. Fredk. Canton, and myself have to-day assisted in the removal of a large curved tusk which was found at the base of the chalky boulder clay formation, and on the top of the underlying middle glacial sand, at a depth of 11 ft. 3 in. from the present surface of the ground.

Numerous pieces of bone evidently belonging to the same animal have been found lying near the tusk, but were removed before we arrived. The spot where this discovery has been made is in a shallow valley at Charsfield, a village about eleven miles north of Ipswich, and it is owing to the kindness of Mr. W. H. Youngman that I was apprised of the find.

This shallow valley is a typical example of the dry valleys so often met with in Suffolk and elsewhere, and is not apparently connected with any present river system.

The section in the small pit, which is being worked for stone, shows 1 ft. of surface humus, 3 ft. of blackish gravel, 4 ft. of chalky boulder clay, developing into, and evidently a part of, a loamy gravel about 3 ft. in thickness.

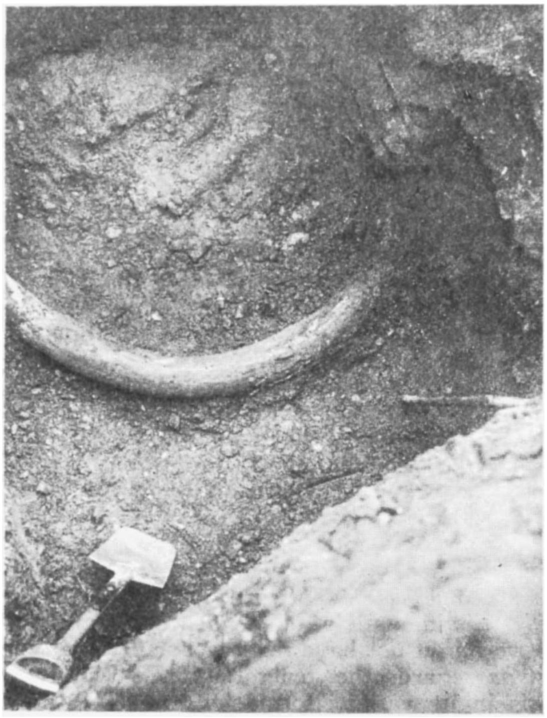
At the bottom of the section the fine, stoneless middle glacial sand is exposed. The accompanying

© 1912 Nature Publishing Group

photograph, taken by Mr. Frank Woolnough with the camera suspended over the pit, shows the tusk *in situ,* it being afterwards removed by my man Baxter and myself, who, finding it very friable, had to use great care in getting it up intact.

The remains have been sent away for identification, but it was obvious that they presented the same amount of mineralisation as was present in the human bones found by me at exactly the same horizon at Ipswich, in October of last year. As in this latter case the remains were found lying partly embedded in glacial sand and partly in the different overlying material, also in both cases the amount of iron staining is very slight.

This discovery appears to me to be of some importance, and affords an answer to those of my critics who were dissatisfied with my discovery of the human skeleton because I had not found any other mammalian bones at the same horizon at which this occurred.



It is also an additional piece of evidence that the top of the middle glacial sand was a land-surface in pre-chalky boulder clay times. J. Reid Moir.

12 St. Edmund's Road, Ipswich, May 5.

Les Éclipses d'Hiver et les Éclipses d'Été.

Nous venons d'assister à un phénomène très curieux le 17 avril dernier. Au premier abord il paraît avoir été le résultat d'une faveur exceptionnelle d'Éole. Monsieur Angot, le savant Directeur du bureau central météorologique de France, a compulsé avec soin l'histoire de la science qu'il cultive si assidûment, il est arrivé à l'idée que les astronomes faisant d'immenses préparatifs pour observer l'éclipse à terre avaient très peu de chance de rencontrer un ciel serein permettant d'arriver à des mesures angulaires irréprochables; il leur en attribuait huit sur cent.

Monsieur Angot oubliait que l'éclipse qui a soulevé une si vive émotion se produisait dans les jours froids du printemps, que les vents soufflaient dans la direction de l'Est ou du Nord et que, par conséquent, le refroidissement produit par l'éclipse devait très difficilement déterminer la formation de nuées suffisamment épaisses pour empêcher d'observer le Soleil. D'après le compte rendu qui m'est communiqué des treize ascensions exécutées à Paris par Messieurs Bans et Barbotte, le refroidissement a été très énergique; à la hauteur de 2500 mètres ou ils étaient parvenus ils ont constaté que leur thermomètre était descendu à plusieurs degrés centigrades au-dessous de zéro. Cependant grâce à la constitution atmosphérique qui est fréquente en pareille saison les observations terrestres ont été partout irréprochables. Si l'éclipse eut été réellement totale au lieu de l'être d'une façon hypothétique, on aurait vu les couronnes, les protubérances d'une façon merveilleuse sans avoir besoin comme l'ont fait si souvent Sir Norman Lockyer et J. Janssen de se transporter dans les Indes, dans l'Indo-Chine, en Égypte et dans les îles les plus isolées de l'Océan Pacifique.

Mais il existe une circonstance fort intéressante dont Mr. Angot n'a pas tenu compte et qui justifie parfaitement les efforts qu'a fait récemment le fils de Sir Norman pour suivre l'exemple de son illustre père.

En été dans le voisinage de la fin de juin, le disque du Soleil est réduit à son minimum parce que la terre arrive à son aphélie; alors notre satellite a beaucoup moins de peine à le recouvrir. Si par hasard à l'heure de l'éclipse la lune est voisine de son périgée le phénomène atteint son maximum; il peut durer plusieurs centaines de secondes, et on a tout le temps d'explorer le voisinage de l'astre qui malheureusement ne peut nous éclairer sans nous éblouir et nous cacher par conséquent tout ce qui se passe autour de lui.

Mais à cette époque, au moins dans notre hémisphère, l'air est saturé de vapeurs de sorte que les belles observations d'éclipse sont très rares; il est excessivement difficile d'en profiter pour résoudre les magnifiques problèmes dont on s'occupe si vivement depuis qu'Arago s'est immortalisé en les signalant lors de la grande éclipse totale visible à Perpignan en 1842. C'est ce qui fait qu'on a attaché tant de prix aux travaux de Sir Norman qui a imaginé et pratiqué avec tant d'habileté les recherches spectrographiques autour du Soleil sans se préoccuper des éclipses. Il est bon de faire remarquer que l'hémisphère austral se trouve à ce point de vue dans une situation beaucoup plus favorable que le nôtre et que les astronomes de Sydney ont beaucoup plus de chance que les nôtres d'observer de belles éclipses totales. En effet lorsqu'elles arrivent dans leur hiver qui correspond à notre été le Soleil est à son minimum.

Je ne peux terminer sans faire remarquer que l'éblouissement produit par le Soleil diminue rapidement par l'altitude à laquelle parvient l'aéronaute quoique la puissance calorifique du Soleil augmente. Il en résulte qu'on voit certaines étoiles plus voisines de l'astre que si l'on restait à terre. Par conséquent en s'élevant très haut lors du crépuscule ou de l'aurore on peut explorer d'assez près la banlieue du Soleil. C'est même cette circonstance qui faisait que Le Verrier avait désiré dans les dernières années de sa carrière faire exécuter des ascensions à l'observatoire de Paris pour découvrir la planète Vulcain à l'existence de laquelle il croyait fermement.

On peut voir du reste dans les comptes de ce grand établissement les dépenses qu'il a faites, lorsqu'il m'a chargé en 1875 de remettre en état le ballon de l'observatoire, malheureusement cet appareil avait été si maltraité par les aéronautes qui l'avaient eu

© 1912 Nature Publishing Group